to reconcile the differences observed. Mr. Buchanan, however, does not enter into the question, but restates the position he took up in a paper read at the International Geographical Congress in 1895, to the effect that this type of hydrometer gives not comparative but absolute results, and is "a pyknometer where the volume of liquid *excluded* up to a certain mark is weighed instead of that *included* up to a similar mark."

GERMAN METEOROLOGICAL REPORTS.

THE organisation reports of (1) the Royal Prussian Meteorological Institute (Berlin) and (2) the Deutsche Seewarte (Hamburg) for the year 1912 have been recently published. The operations of these establishments are quite distinct; the institute dates from 1847, as a department of the Statistical Bureau, under Dr. W. Mahlmann, to whose life and work a special article is devoted in the report for this year. The work of the institute (which became an independent meteorological organisation in 1886) consists to a considerable extent of special scientific researches which appear in the *Abhandlungen* and elsewhere, and in the preparation and publication of the observations made at a large number of stations, separate departments dealing specially with meteorology, rainfall, and thunderstorms. It also controls the work of Potsdam Observatory, which undertakes various branches of geophysical investigation. Among the various discussions in this year's report we may mention an interesting inquiry into the Thuringian deluge of May, 1613, by Dr. Hellmann (director).

The Deutsche Seewarte (Hamburg) may be said to date from 1867, under Dr. W. v. Freeden, and was established as a Government institution in 1875; its great work, which is well known to our readers, will always be associated with the name of Dr. v. Neumayer. It deals with all branches of maritime meteorology and weather telegraphy, and controls a limited number of meteorological and storm signal stations. Among its many useful publications may be mentioned (1) monthly meteorological charts of the North Atlantic, observations at many oversea stations and colonies, a laborious and useful atlas of daily synchronous weather charts for the North Atlantic (in conjunction with the Danish Meteorological Institute), also scientific discussions in the *Archiv der Deutschen Seewarte* and elsewhere. During the year 1912 it received 4391 months' observations taken on board ship, and made 351 ascents by kites, captive and pilot balloons, in connection with the exploration of the upper air.

ORNITHOLOGICAL NOTES.

ACCORDING to the Journal of the South African Ornithologists' Union for December, 1912, a special effort is being made to arouse interest in the dates of arrival and departure of the local migratory species, such as the bee-eater, red-legged kestrel, swallow, and golden oriole. With this object in view, school teachers willing to assist are to be admitted to associate membership at a greatly reduced subscription.

Mr. Gregory Mathews is to be congratulated on the completion, with No. 8, of the first volume of *The Austral Avian Record*, this part including a notice of birds described by Gould from Norfolk, Lord Howe, and Philip Islands.

It has long been known that certain kinds of birds—especially hornbills—are in the habit of periodically shedding and casting the lining membrane of their gizzards. According to a letter from Mr. D. Macintyre published in *The Field* of March 31, and an article by Mr. H. H. Smith in the April number of *British Birds*, the curlew must be added to the small list of species in which this strange act occurs.

In the January issue of *The Ibis* Dr. Sclater contrasts the new "Hand-List of British Birds," by Dr. Hartert and others, with the list issued by the British Ornithologists' Union in 1883, and points out that out of the 376 species included in the latter the names of no fewer than 200 would have to be changed if the nomenclature of the "Hand-List" were accepted. Dr. Sclater considers it undesirable to take the tenth, in place of the twelfth, edition of the "Systema Naturæ" as the basis of our zoological nomenclature, and points out that according to the Stricklandian code "tautonyms" are prohibited, while liberty to correct mistakes and bad grammar is permitted. "If," he adds, "we take Latin for the language of science, we are surely bound to follow its grammatical rules."

PROMOTION OF RESEARCH BY THE CARNEGIE INSTITUTION OF WASHINGTON.

THE Year Book for 1912 of the Carnegie Institution of Washington has now been issued. The record of work accomplished contained in its pages shows there has been no diminution in the efforts of the trustees to secure a wise expenditure of the funds placed at their disposal for the advancement of research in science.

The following list shows the departments of investigation to which the larger grants were made by the trustees and the amounts allotted from these grants by the executive committee during the year :—

	£
Department of Botanical Research	7,600
Department of Economics and Sociology ...	2,500
Department of Experimental Evolution ...	7,500
Geophysical Laboratory	15,000
Department of Historical Research	5,300
Department of Marine Biology	3,600
Department of Meridian Astrometry	5,200
Nutrition Laboratory	9,700
Division of Publication	2,000
Solar Observatory	51,000
Department of Terrestrial Magnetism ...	19,600
	129,000
Transferred from Nutrition Laboratory to unappropriated fund	1,000
	130,000

Numerous minor grants were made, amounting to very nearly 40,000*l.*, and grants for publication authorised during the year reached a total of about 8600*l.* During the year 1912 the income of the institution was almost 250,000*l.*, and the total expenditure some 229,600*l.*

The following extracts from the *résumé* of the investigations of the year included in the report of the president of the institution, Dr. Robert S. Woodward, will give some indication of the work which has been inaugurated and encouraged :—

Although the departments of investigation, like the institution as a whole, have fallen short of popular expectations in the rapidity of their growth, it now appears plain, in the light of their actual experience, that this growth has been somewhat too rapid for safety. Along with this rapid growth and with the signal success of the departments in their several fields of research, there are now coming also numerous requests for cooperation with other organisations and

© 1913 Nature Publishing Group

with individuals. But while these requests are in general gratifying and often praiseworthy, they present some obvious hazards. There is need, therefore, of constant caution against the dangers of undue expansion and affiliation which lead to dissipation of effort and resources. It should be kept in mind that concentration on definitely limited programmes, continuity of effort, and energetic assiduity are the factors most essential to progress in the domain of research.

The geographical range of the work of the department of botanical research, which centres in the Desert Laboratory at Tucson, Arizona, has been extended during the past year to include certain portions of the deserts of northern Africa. Studies have been continued at the Desert Laboratory, at the Carmel Laboratory on the California coast, at Salton Sea, and at various substations where observations are made on the phenomena presented by plants under strikingly varying conditions. One of the most important investigations undertaken during the past year is that of a comprehensive study of the large and highly diversified family of cactus plants.

The advances made by the department of experimental evolution during the past year have been chiefly along the lines of studies in cytology, in the chemistry of pigmentation, in the factors of mutation, and in the problems of human heredity. These studies have been carried on by aid of experiments with plants and animals and by aid of rapidly accumulating statistical data concerning human traits and their transmission through successive generations. The director has been able to give much of his time to studies in human heredity by reason of his connection with the Eugenics Record Office. Very interesting chemical studies have been carried on by Dr. Gortner, a member of the staff, in respect to the chemical nature of pigments which determine colour characteristics, especially of the plumage in birds, of the wool in sheep, and of the skin in men. Dr. Shull has continued his fertile studies into the heredity of plants, including further investigations into the connection between heredity and environment in the case of corn. These further studies confirm his earlier conclusions and show also that the hereditary traits of different strains are maintained irrespective of environmental influences.

Two specially noteworthy publications of the geophysical laboratory have been issued during the year by the institution, namely No. 157, "High Temperature Gas Thermometry," and No. 158, "The Methods of Petrographic-Microscopic Research." The purpose of the first of these was to give an account of the apparatus and methods for accurate measurement of the critical temperatures incident to mineral combinations; and the object of the second is to place, so far as practicable, microscopic study of minerals upon a quantitative basis.

Special attention is directed in the director's report to extended studies on quartz and other forms of silica, which is the most widely diffused ingredient in rock masses; to further experiments on the conditions of association of the three oxides, lime, alumina, and silica, which in addition to being the commonest components of igneous rocks, are also incidentally the three principal ingredients of the so-called Portland cement; to mineral sulphides, which are often of great economic importance; and to mineral and rock densities.

Perhaps the most interesting of the more recent investigations of the laboratory are those of the physics and chemistry of active volcanoes undertaken tentatively a year ago and pursued with very gratifying success during the past summer. It has proved practicable for members of the staff to descend into the crater of Kilauea and to collect considerable quantities of gas as it emerged from the liquid lavas of the crater. Specimens of gases were collected in glass tubes without contamination from the air, and these have been brought to the laboratory at Washington for detailed study. There seems little reason to doubt that the phenomena of vulcanism will be ultimately revealed by the methods, apparatus, and technique developed by the staff of the laboratory.

The independent transportation facilities furnished by the new vessel, *Anton Dohrn*, and the repairs and improvements to the laboratory completed a year ago, have proved highly advantageous to the department of marine biology. By means of the *Anton Dohrn* the entire Gulf and West Indian region becomes open to investigation by the department. The director records with appreciation a gift to his fleet by Hon. John B. Henderson, of Washington, D.C., of a 23-ft. 6-h.p. launch, which has already proved a very useful adjunct in the diversified work of the department, since many different investigations are carried on simultaneously by different individuals at the laboratory headquarters. During February and March of the current year the director established a temporary laboratory at Montego Bay, Jamaica, a region which sustains important biological relations to the vicinity of the Tortugas group of islands. The director of the department has issued, as No. 162 of the publications of the institution, an additional volume of his series on the jelly-fishes of the world, the title of this volume being "Ctenophores of the Atlantic Coast of North America."

Special attention has been given in the department of meridian astrometry to the reduction of the meridian observations made at San Luis, Argentina. The determination of the two coordinates of stars from this work, namely right ascension and declination, have proceeded simultaneously. The assignment of stellar magnitudes, however, must await the photometric determinations which have been made at San Luis since the meridian measurements were completed. Late advices announce that it will be completed by the end of the present calendar year. The great quantity of priceless observational and derived data accumulated by the department rendered it imperative that special provision should be made for their safe storage. Accordingly the executive committee authorised the construction of a fireproof vault within the walls of the Dudley Observatory. This vault is now ready for occupation and the records will be placed therein as soon as practicable.

One of the most interesting of the many investigations under way in the nutrition laboratory during the year is that of the metabolism of a subject who underwent a prolonged fast, extending to thirty-one days without food, and drank only distilled water during this time. This investigation required the cooperation of a number of chemical, pathological, and psychological experts. A detailed report on this elaborately observed experiment is at present in preparation. Another noteworthy investigation of the year is that on metabolism during severe muscular work, undertaken by Dr. E. P. Cathcart, of the University of Glasgow, who was a research associate of the institution during the winter of 1911–12. Amongst other important results of the latter research is the measure it affords of the mechanical efficiency of man. An account of this investigation is likewise in preparation for publication.

Highly effective progress has been made by the department of terrestrial magnetism during the past year in its magnetic survey of the globe. By means of the non-magnetic ship *Carnegie* it is now easier to make a magnetic survey of the ocean areas than of

© 1913 Nature Publishing Group

the land areas, for the former are now more readily accessible than the latter. At the end of the preceding fiscal year the *Carnegie* was at Batavia, Java. On November 21, 1911, she set sail for an additional circuit of the Indian Ocean, when she proceeded to Manila, Philippine Islands, where she arrived February 3, 1912. From Manila she proceeded to Suva, thence to Tahiti, and afterwards to Coronel, Chile. During the fiscal year she traversed about 28,000 miles. Her courses are arranged to intersect as frequently as possible her own previous tracks, those of the *Galilee*, and those of previous expeditions on which magnetic elements were observed. Valuable checks on the determinations of these elements are thus secured, and in case of considerable intervals between the dates of different determinations, data for secular variation of the magnetic elements are also obtained. As related in the report of a year ago, unexpectedly large errors were found in the best magnetic charts of the Indian Ocean and for some parts of the Pacific Ocean.

Observations have been continued simultaneously on land areas, embracing portions of five continents and about twenty different countries. Many noteworthy series of transcontinental stations have now been completed. Of these, one extending across the entire continent of South America, beginning at Para, at the mouth of the Amazon, and extending to Callao on the Pacific coast, by way of the Amazon and Ucayali rivers and Lima, has been finished during the past year.

The past year has been one of minimum sun-spot activity; but effective progress has been made in many other branches of solar and stellar research undertaken by the solar observatory. The wide range of this work may be indicated by the fact that the results of the investigations of the year are summarised by the director under thirty-five different heads. The new tower telescope has been completed, and important auxiliary apparatus has been added to the equipment of the 60-in. reflector. A fireproof office building, which will afford adequate quarters for the staff and safety for the original records and photographic plates of the observatory, has been constructed and made ready for occupancy during the year.

The 150-ft. tower telescope with its spectrograph and spectroheliograph has been tested and found to be quite up to expectations. The 60-in. reflector has proved increasingly effective in the wide variety of work undertaken with it. Between forty and fifty new spectroscopic double stars have been found; and amongst the many stars the radial velocities of which have been measured is one which surpasses all others hitherto observed, its velocity being about 150 miles per second.

Two eminent research associates, namely Prof. Kapteyn, of Groningen, and Prof. Störmer, of Christiania, have taken part in the work of the observatory during the year.

The laborious task of shaping and testing the glass disc for the proposed 100-in. telescope has proved a disappointment in showing that this disc, which was accepted provisionally from the makers several years ago, will not answer the requirements. It appears possible that some expedients may be adopted to overcome the instability of this disc; but the probability that it may be made to work satisfactorily is small. In the meantime the makers of such large discs have not succeeded in making one of sufficient uniformity in density. In view of these difficulties the director is disposed to try a thinner disc if one can be found possessing the requisite degree of homogeneity. Thus this project must suffer further delay, although it is practically certain that the difficulties presented may be ultimately overcome.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The subject selected for the Adams prize in 1914 is "The Phenomena of the Disturbed Motion of Fluids, including the Resistances encountered by Bodies moving through them." A theoretical re-discussion of the problem of fluid resistance may be undertaken, either in general or in some cases, in the light of the experimental knowledge regarding the resistances and the nature of the broken motion of the fluid which is becoming available in the publications of the aëronautical laboratories of various countries. Information has been accumulating regarding the nature and mode of travel of meteorological atmospheric disturbances, such as cyclonic movements and line squalls, the propagation of minute waves of barometric pressure, and the nature of the lower boundary of the upper calm region of the air. A dynamical discussion of these topics, or of simpler problems in illustration of them, might be undertaken. The prize is open to the competition of all persons who have at any time been admitted to a degree in the University of Cambridge. The value of the prize is about 220*l*. The essays must be sent to the Vice-Chancellor on or before the last day of December, 1914.

The Linacre lecture at St. John's College will be delivered by Dr. Norman Moore, on Tuesday next, May 6, on the physician in English history.

The professor of botany has recently received for the botanical museum a collection of 100 water-colour studies of Italian and other South European flowering plants from Mrs. Latimer-Jackson. The sketches, which were made by Mrs. Latimer-Jackson in the course of several visits to Sicily and different parts of the mainland, have not only great artistic merit, but will be useful to students and of considerable interest to many members of the Senate other than professional botanists.

A syndicate has been nominated to consider what changes, if any, are desirable in the regulations relating to the Previous Examination, in the mutual relations of the Previous Examination and the examinations held by the Highest Grade Schools Examination Syndicate and the Local Examinations and Lectures Syndicate, and in the relations of the Previous Examination to examinations held by other bodies. The syndicate has power to confer with the Highest Grade Schools Examination Syndicate, the Local Examinations and Lectures Syndicate, and such other bodies and persons as it may think fit. This is another attempt to bring what is practically the entrance examination of the University into line with modern thought.

OXFORD.—On April 29 Congregation approved a decree authorising the expenditure of 600*l*. in adapting the chemical laboratory at the museum to the immediate needs of the Waynflete professor of chemistry (Prof. W. H. Perkin).

WE learn from *Science* that Princeton University has received three gifts: 20,000*l*. from Mr. and Mrs. Russell W. Moore, of New York City, to endow a professorship of chemistry; 25,000*l*. given anonymously for a professorship not named; and 6000*l*. from Mr. J. D. Cadawallader, of New York City.

THE London County Council will be prepared to award for the session 1913–14 a limited number of free places at the Imperial College of Science and Technology, South Kensington, S.W. The instruction will be of an advanced nature, and therefore only

© 1913 Nature Publishing Group